

WHAT IS CLAIMED IS:

1. An apparatus for detecting an amount of strain comprising:
a strain generating part to which strain is to be applied;
an electrical insulating layer formed on the strain generating
5 part; and
sensing elements formed on the electrical insulating layer, each
of said sensing elements being made of a silicon film, said silicon film
comprising a poly-crystalline main layer and a poly-crystalline
interface-layer, which comes into contact with the electrical insulating
10 layer.
2. The apparatus as claimed in Claim 1, wherein:
said silicon film is subjected, after formation thereof, to an
annealing process at a temperature of from 540°C to 590°C.
3. The apparatus as claimed in Claim 1, wherein:
15 said strain generating part has a main body made of
martensitic precipitation hardened stainless steel, which comprises
from 3 to 5 wt.% Ni, from 15 to 17.5 wt.% Cr and from 3 to 5 wt.% Cu.
4. The apparatus as claimed in Claim 2, wherein:
said silicon film contains an impurity as added in such a manner
20 that specific resistance of the silicon film before said annealing process
is within a range of from $7 \times 10^{-3} \Omega \cdot \text{cm}$ to $3.3 \times 10^{-2} \Omega \cdot \text{cm}$ and the
specific resistance of the silicon film after said annealing process is
within a range of from $3 \times 10^{-3} \Omega \cdot \text{cm}$ to $1.7 \times 10^{-2} \Omega \cdot \text{cm}$.
5. The apparatus as claimed in Claim 4, wherein:
25 said impurity is boron.
6. A method for manufacturing an apparatus for detecting an

amount of strain, comprising the steps of:

(a) preparing a strain generating part to which strain is to be applied, ;

5 (b) forming an electrical insulating layer on said strain generating part;

(c) preparing material for a silicon film; and

(d) forming the silicon film on said electrical insulating layer, utilizing said material to provide sensing elements thereon, said silicon film comprising a polycrystalline main layer and an interface-layer,
10 which comes into contact with the electrical insulating layer,
characterized in that:

said step (a) is carried out, utilizing martensitic precipitation hardened stainless steel, which comprises from 3 to 5 wt.% Ni, from 15 to 17.5 wt.% Cr and from 3 to 5 wt.% Cu, to form a main body of said
15 strain generating part;

said step (c) comprises adding boron as an impurity to said material for the silicon film so that specific resistance of the silicon film is within a range of from $7 \times 10^{-3} \Omega \cdot \text{cm}$ to $3.3 \times 10^{-2} \Omega \cdot \text{cm}$; and

said method further comprises (e) subjecting, after said step (d),
20 said silicon film to an annealing process at a temperature of from 540°C to 590°C so that the specific resistance of the silicon film is within a range of from $3 \times 10^{-3} \Omega \cdot \text{cm}$ to $1.7 \times 10^{-2} \Omega \cdot \text{cm}$, thus crystallizing said interface-layer.

7. The method as claimed in Claim 6, wherein:

25 said step (e) is carried out in plasma into gas.